



217/782-2113

OPERATING PERMIT

EPA Region 5 Records Ctr.



355913

PERMITTEE

The Sherwin-Williams Co.
Attn: Robert C. Martin
11541 S. Champlain
Chicago, IL 60628

Application No.: 82110038I.D. No.: 031600AH0Applicant's Designation: RP-C0187-1Date Received: March 23, 1989Subject: Resin ManufacturingDate Issued: July 21, 1989Expiration Date: July 19, 1994Location: 11541 S. Champlain, Chicago, IL

Permit is hereby granted to the above-designated Permittee to OPERATE emission source(s) and/or air pollution control equipment consisting of 150 storage tanks, 10 prefilter and thinning tanks, 1 overflow tank, 3 resin reactors with condensers, 1 kettle (#1) with eductor, scrubber and condenser, 1 kettle (#8) with condenser and scrubber, 3 kettles (#2, #6 and #7) with condensers, 1 kettle (#9) with condenser and packed column, small natural gas heaters for all 6 kettles, 9 receiving tanks, 6 resin weigh tanks, 6 weigh tanks, 22 mixing tanks, 2 hot oil tanks, condensers for prefilter tanks and Zone Tank Reactor 4 and Auxiliaries as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Records of VOM Leaks as required by 215.622 a, b and c shall be kept for two years and shall be made available to Agency personnel upon written or verbal request.

Terry A. Sweitzer, P.E.
Manager, Permit Section
Division of Air Pollution Control

TAS:AMT:jmm/0376K/21

cc: Region 1 ^{AMT} 7-21-89



~~CC: FOS~~ → AHT
031-600-AHP

The Sherwin-Williams Company
11541 S. Champlain Ave.
Chicago, Illinois 60628-5795
Phone (312) 821-3000

JUL 1 9

July 12, 1989

Mr. Terry Sweitzer
State of Illinois Environmental
Protection Agency
Division of Air Pollution Control
2200 Churchill Road
Springfield, IL 62706

RE: Our 30 June 1989 application for renewal of Operating Permit #82110038

Dear Mr. Sweitzer:

The enclosed pages were inadvertently left out of our 30 June 1989 submittal. These pages should replace respective pages in our 1987 submission, i.e., RP-CON89-6 should replace RP-CON87-6.

Sincerely,

Robert C. Martin
Director, Environmental Services

mg

22: Our 21 days' application for removal of Operating Permit 0001110000

1. The application for removal of Operating Permit 0001110000 was submitted to the relevant authority on 21st day of April 2020.

STATEMENT REGARDING RESIN PLANT OPERATION

The Chicago Resin Plant produces approximately 100 different formulations over the course of a year. Consequently, it is not possible to give exact figures for kettle and reactor inputs. They have, therefore, been shown in ranges by chemical class. (See Appendix A.)

Because of the lengthy batch processing times, this is an around-the-clock operation. Each product will have a relatively fixed reaction time and a batch size fixed by the capacity of the equipment in which it is made.

While minimum and maximum input and output rates have been shown for kettles and reactors, they represent differences in the products being manufactured, not differences in the production rate of a specific product.

Production can be increased only by operating more days of the week. This is reflected, generally, by the average and maximum operating times shown for the process emission sources.

RP-CON 89-6

EXHIBIT A

ITEMS OF EQUIPMENT OWNED PRIOR TO APRIL 14, 1972

STORAGE TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
70	Bldg. 51-1	5,000
71	"	"
72	"	"
73	"	"
74	"	"
75	"	"
76	"	"
77	"	"
78	"	"
79	"	"
80	"	"
81	"	"
82	"	"
83	"	"
84	"	"
85	"	"
86	"	"
87	"	"
88	"	"
89	"	"
90	"	"
91	"	"
97	Bldg. 52-1	"
98	"	"
99	"	"
100	"	"
101	"	"
102	"	"
103	"	"
104	"	"
105	"	"
106	"	"
107	"	"
108	"	"
*109	"	10,000
*110	"	"
*111	"	"
*112	"	"
*113	"	"
**114	"	"

* Tanks 109-113 are existing tanks which were previously divided into 4-2,500 gallon tanks, dividers were removed to make 10,000 gallon tanks.

** Tank 114 is an existing tank which was divided into 2-5,000 gallon tanks, divider was removed to make a 10,000 gallon tank.

RP-CON 87-7

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
317-A	Bldg. 91-1	5,000
317-B	"	"
318-A	"	"
318-B	"	"
319-A	"	"
319-B	"	"
320-A	"	"
320-B	"	"
321-A	"	"
321-B	"	"
322-A	"	"
322-B	"	"
323-A	"	"
323-B	"	"
324-A	"	"
324-B	"	"
325-A	"	"
325-B	"	"
326	"	9,100
327	"	"
328	"	"
329	"	"
330	"	"
331	"	"
332	"	"
333	"	"
335	"	"
336	"	"
337	"	"
338	"	"
339	"	"
340	"	"
341	"	"
342	"	"
343	"	"
344	"	"
345	"	"
346	"	"
347	"	"
357	"	11,000
358	Bldg. 90-1	12,507
359	"	"
360	"	"
361	"	"
362	"	11,994
363	"	"
364	"	"
365	"	"
366	"	"
372	"	"
373	"	"
374	"	"
375	"	"
376	"	"

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
377	Bldg. 90-1	5,059
378	"	12,025
348-A	Bldg. 91-1	5,000
348-B	"	"
349-A	"	"
349-B	"	"
350-A	"	"
350-B	"	"
351	"	"
352-A	"	"
352-B	"	"
353	"	7,100
354	"	11,000
355	"	"
356	"	"
222	Bldg. 9-A	24,327
227	Bldg. 245-1	24,960
229	"	10,040
230	"	"
232	"	"
248	"	"
249	"	"
1	Bldg. 50-B	5,000
2	"	"
3	"	"
4	"	"
5	"	"
688	Yard A	10,361
689	"	51,200
691	"	"
696	"	15,800
697	"	13,500
602	Bldg. 253-L	24,200
604	"	25,200
605	"	25,700
608	"	15,000
609	"	"
620	"	"
621	"	"
622	"	"
623	"	"
624	"	"
625	"	"
638	"	"
639	"	"
640	"	"
641	"	15,000
643	Yard A	58,857
644	Bldg. 253-L	102,731
610	Yard L	8,000
611	"	"
612	"	"

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<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
613	Yard L	8,000
614	"	"
616	"	"
617	"	"
618	"	"
142	Bldg. 50-4	7,000
143	Bldg. 53-4	8,826

RP-CON 89-10

EXHIBIT A

KETTLES AND REACTORS

<u>KETTLE OR REACTOR NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
K-1	Bldg. 50-3	3,500
K-2	"	3,500
K-6	"	1,000
K-7	"	1,000
K-8	"	1,200
K-9	"	1,500
R-1	Bldg. 65-3	5,000
R-2	"	5,000
R-3	"	1,000

THINNING AND PREFILTER TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
T-1	Bldg. 50-1	7,500
T-2	"	8,000
T-6	"	2,000
T-7	"	2,000
T-8	"	2,500
V-9	Bldg. 53-2	7,000
V-10	"	7,000
V-11	"	7,000
V-12	"	7,000
V-13	"	7,000

EXHIBIT A

CONDENSERS

<u>CONDENSER NO.</u>	<u>LOCATION</u>	<u>SURFACE AREA (FT)</u> ²
HR-1	Bldg. 65-4	400
HR-2	"	"
HR-3	"	207
HT-9	Bldg. 53-2	104.7
HT-10	"	"
HT-11	"	"
HT-12	"	"
HT-13	"	"
HK-1	Bldg. 50-4	400
HK-2	"	"
HK-6	"	250
HK-7	"	"
HK-8	"	"
HK-9	"	400
HT-1	Bldg. 50-1	250
HT-2	"	400
HT-6	"	90
HT-7	"	"
HT-8	"	"
HT-9	"	150

RECEIVING TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
R-1	Bldg. 65-3	100
R-2	"	100
R-3	"	60
K-1	Bldg. 50-3	50
K-2	"	60
K-6	"	50
K-7	"	30
K-8	"	50
K-9	"	100

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EXHIBIT A

MIXING TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>WORKING CAPACITY (GALLONS)</u>
1	Bldg. 11-1	480
3	"	500
4	"	500
5	"	1,250
6	"	1,250
7	"	1,250
8	"	160
9	"	160
12	"	500
21	Bldg. 9-1	1,800
22	"	1,800
23	"	4,000
24	"	4,000
1	Bldg. 58-2	1,000
2	"	1,000
3	"	1,000
4	"	1,000
5	"	1,000
6	"	1,000
7	"	450
8	"	300
102	Bldg. 58-3	3,000

WEIGH TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
1	Bldg. 50-4	1,000
3	"	1,500
4	"	500
V-1	Bldg. 65-4	4,000
V-2	"	4,000
V-3	"	800

RP-CON 89-13

EXHIBIT A

COMBUSTION EQUIPMENT

<u>ITEM NO.</u>	<u>LOCATION</u>	<u>NOMINAL FIRING RATE</u>
CD-1	Bldg. 48-2	2,000,000 BTU/Hr.
CD-2	" 48-B	1,240,000 "
CD-6	" 25	550,000 "
CD-7	" 25	550,000 "
CD-8	" 48-A	1,000,000 "
CD-9	" 48-A	1,000,000 "

MISCELLANEOUS ITEMS

<u>ITEM</u>	<u>LOCATION</u>	<u>SIZE OR CAPACITY</u>
Glycol Scrubber GT-1	Bldg. 50-3	6' x 2'2" dia.
Glycol Scrubber GT-8	"	9'6" x 1'6" dia.
Resin Dust Collector	Bldg. 58-3	750 CFM
Eductor Kettle 1	Bldg. 50-4	6 x 6 Venturi
Hot Oil Expansion Tank	Ground Bldg. 48	250 gallons
Hot Oil Dump Tank	"	600 gallons
Heat Exchanger Kettle 1	Bldg. 50-2	300 ft ²
Emergency Overflow Tank	Rood Bldg. 65	15,000 gallons

The above listed items in the pages of Exhibit A were in place prior to April 14, 1972 and were in compliance with regulations governing the control of air pollution prior to April 14, 1972 or were installed after April 14, 1972 in compliance with existing air pollution control regulations. All of the listed items were previously permitted on Permit 72100425.

RP-CON 89-14

EXHIBIT C

RESIN WEIGH TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>CAPACITY (GALLONS)</u>
W-1	Bldg. 50-4	1,500
W-3	"	1,500
W-4	"	500
V-1	Bldg. 65-4	4,000
V-2	"	4,000
V-3	"	800

RP-CON 89-219

EXHIBIT D

MIXING TANKS

<u>TANK NO.</u>	<u>LOCATION</u>	<u>WORKING CAPACITY (GALLONS)</u>
1	Bldg. 11-1	480
3	"	500
4	"	500
5	"	1,250
6	"	1,250
7	"	1,250
8	"	160
9	"	160
12	"	500
21	Bldg. 9-1	1,800
22	"	1,800
23	"	4,000
24	"	4,000

RP-CON89-222

EXHIBIT E

EMISSIONS FROM VENT CONDENSERS

SOLVENT PROCESSING

KETTLES 1, 2, 6, 7, 8 and 9

CONDENSERS: HK-1, HK-2, HK-6, HK-7, HK-8 and HK-9

CONTROLLED EMISSION POINTS: CEK-1, CEK-2, CEK-6, CEK-7, CEK-8, CEK-9

In solvent processing, the reaction proceeds for an average of 16 hours (12 hrs. min. - 30 hrs. max.). A solvent, typically mineral spirits, is used to drive the polymerization to completion by stripping off water of reaction. The water and solvent are condensed in the condenser and drained into the receiving tank where separation occurs. The solvent is returned to the kettle and the water is drawn off to the sewer. This proceeds under atmospheric conditions. Minor amounts of inert gases (non-condensibles) evolve from the batch and, after passing through the vent condenser, are emitted to the atmosphere at about 90°F. Flow is approximately 2 CFM at atmospheric pressure of inert gases saturated with mineral spirits vapor. Mineral spirits vapor pressure is 5mm HG at 90°F.

EMISSIONS - MAXIMUM PER HOUR:

$$2 \text{ CFM } (60 \text{ mm}) (5 \text{ mm HG } (1 \text{ lb. MOL}) (142) = 0.3 \text{ lb/hr.}$$

$$(\text{Hour}) (760 \text{ mm}) (401 \text{ cu. ft.}) (1 \text{ lb. MOL})$$

RP-CON 89-298

EXHIBIT F

POLYESTER PROCESSING

KETTLES K-1, K-8 and K-9

EMISSIONS FROM CEK-1, CEK-8, CEK-9

When processing polyesters, the reaction proceeds at atmospheric pressure for an average of 14 hours (9 hrs. min.-35 hrs. max.). During this time, water and glycol form an azeotropic mixture and are evolved from the batch. The glycol is captured in a packed tower and returned to the batch. The overhead from the packed tower passes into the condenser where the water is condensed. The condensate is drained to the receiving tank. A portion of the water is returned to the packed tower as the scrubbant, the remainder is discharged to the sewer.

The volume of gas emitted from the condenser is estimated at a maximum of 2 CFM. It would be saturated with glycol vapor at the exit temperature of 90°F. The most volatile glycol used is ethylene glycol with a vapor pressure less than 0.1 mm HG at 90°F.

Maximum emissions of organic material per hour would be:

$$\begin{array}{l} 2 \text{ CFM } (60 \text{ min}) (0.1 \text{ mm}) (1 \text{ lb. MOL}) \quad (62) \quad = 0.02 \text{ lbs/hr.} \\ \quad \quad \quad (\text{Hour}) \quad (760 \text{ mm}) (401 \text{ cu.ft.}) (1 \text{ lb. MOL}) \end{array}$$

RP-CON 89-299

EXHIBIT G

SOVLENT AND POLYESTER PROCESSING

KETTLE 1

EMISSIONS FROM EDUCTOR ED-1

CEED-1 Dry stock is loaded into Kettle 1 at the start of each batch (8-35 hour intervals). At this time, a water eductor is used for a period of approximately one hour to pull in any dust created in the loading operation. The water eductor is also a Venture Scrubber and is rated nominally at greater than 90% efficiency for this type of service by the manufacturer.

PARTICULATE EMISSIONS:

$$\begin{array}{rcl} 270 \text{ SCFM} & (0.05 \text{ Gr}) & (60 \text{ min.}) & (1 \text{ lb}) & 0.10 \text{ (90\% Eff.)} \\ & \text{(SCF)} & \text{(Hour)} & \text{(7000 Gr)} & \\ & & & & = 0.12 \text{ lb/hr.} \end{array}$$

RP CON 89-300

EXHIBIT H

CONDENSATE RECEIVING TANKS

<u>RECEIVING TANK NO.</u>	<u>LOCATION</u>	<u>SIZE</u>	<u>CAPACITY (GALS.)</u>
R-1	Bldg. 65-3	24" x 48"	100
R-2	"	24" x 48"	100
R-3	"	20" x 48"	60
K-1	Bldg. 50-3	18" x 48"	50
K-2	"	20" x 48"	60
K-6	"	18" x 48"	50
K-7	"	20" x 24"	30
K-8	"	18" x 48"	50
K-9	"	24" x 48"	100

These receiving tanks are auxiliary equipment for the reactors and kettles indicated by the tank number.

RP-CON 89-303

EXHIBIT J

CALCULATION OF EMISSIONS FROM

VENT CONDENSERS

PREFILTER TANKS 1, 2, 6, 7, 8 and 9

EMISSION POINT: CEHT-1, CEHT-2, CEHT-6, CEHT-7, CEHT-8, CEHT-9

When processing is completed in one of the kettles served by these prefilter tanks, the batch is dropped into the tank into which the reducing solvent, typically mineral spirits, has already been pumped. The dropping would occur at intervals of 9 to 35 hours and would take approximately 1 hour. The maximum batch size dropped would be 3,500 gallons (the largest kettles served by these tanks). Emissions would be the gas volume displaced by the batch saturated with mineral spirits vapor at the exit temperature from the vent condenser. Condensate is returned to the tank.

Flow out of the tank (maximum):

$$3500 \text{ gals.} \frac{(1 \text{ cu.ft.})}{(7.48 \text{ gal.})} \frac{(1)}{(60 \text{ min})} = 7.8 \text{ cu.ft./min. at } 90^{\circ}\text{F.}$$

$$= 6.98 \text{ SCFM}$$

Emissions from the condenser:

Inert gases saturated with mineral spirits vapor at 90°F.

Mineral spirits vapor pressure at 90°F. is 5 mm HG.

$$7.8 \text{ CFM} \frac{(60 \text{ min.})}{(\text{Hr.})} \frac{(5 \text{ mm})}{(760 \text{ mm})} \frac{(1 \text{ lb. MOL})}{(401 \text{ cu.ft.})} \frac{142 \text{ lb.}}{(1 \text{ lb. MOL})} = 1.1 \text{ lbs/hr.}$$

cont.....

RP-CON 89-320

EXHIBIT J

$$\frac{7.8 \text{ CFM}}{1} \cdot \frac{(60 \text{ min.})}{(1 \text{ Hr.})} \cdot \frac{(5 \text{ mm})}{(760 \text{ MM})} \cdot \frac{(1 \text{ lb. MOL.})}{(401 \text{ cu.ft.})} \cdot \frac{142 \text{ lb}}{(1 \text{ lb. MOL})} = 1.1 \text{ lbs/hr.}$$

Emissions from prefilter tanks associated with smaller kettles would have proportionately lower emissions (see below).

Note that prefilter tanks operate for approximately 1 hour for each batch and, consequently would not emit organic material at the calculated rate for more than 1 to 2 hours per day.

Emissions proportional to kettle size:

Prefilter	Kettle	Emissions
<u>Tank</u>	<u>Capacity</u>	<u>Lbs/Hr.</u>
1	3,500 gal.	1.1
2	3,500 gal.	1.1
6	1,000 gal.	0.3
7	1,000 gal.	0.3
8	1,200 gal.	0.4
9	1,500 gal.	0.5

RP-CON 89-321

EXHIBIT K

CALCULATION OF EMISSIONS FROM VENT CONDENSERS

EMISSION POINTS: CEHV-9 to CEHV-13

Prefilter tanks V-9 through V-13 receive materials at specified solids content from reactors 1, 2 and 3. Consequently, there is no solvent present other than that which is in the product as received. The maximum batch size held in these tanks is 5,000 gallons. The solvent used in these products would typically be Xylene. The batch would enter the tank over a period of approximately one hour and the gas displaced would be saturated with Xylene at the batch temperature. Each tank is vented through a condenser and the condensate is returned to the tank. These tanks would not, as a rule, receive more than one batch per day and would generally receive less than one. Emissions would occur during the loading time of one hour per batch.

Flow-out of tank (maximum):

$$5,000 \text{ gals.} \frac{(1 \text{ cu.ft.})}{(7.48 \text{ gal.})} \cdot \frac{(1)}{(60 \text{ min.})} = 11.1 \text{ cu.ft./min. at } 85^{\circ}\text{F.}$$

$$= 10.8 \text{ SCFM}$$

Emissions from the condenser - Xylene:

$$11.1 \text{ CFM} \frac{(60 \text{ min.})}{\text{HR}} \cdot \frac{(12 \text{ mm})}{(760 \text{ mm})} \cdot \frac{(1 \text{ lb. MOL})}{(397 \text{ cu.ft.})} \cdot \frac{(106 \text{ lbs.})}{(1\# \text{ MOL})} = 2.8 \text{ lbs/hr.}$$

RP-CON89-327



STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
2200 CHURCHILL ROAD
SPRINGFIELD, ILLINOIS 62706

**STANDARD CONDITIONS
FOR
OPERATING PERMITS**

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special permit condition(s).

1. The issuance of this permit does not release the permittee from compliance with state and federal regulations which are part of the Illinois State Implementation Plan, as well as with other applicable statutes and regulations of the United States or the State of Illinois or with applicable local laws, ordinances and regulations.
2. The Agency has issued this permit based upon the information submitted by the permittee in the permit application. Any misinformation, false statement or misrepresentation in the application shall be grounds for revocation under 35 Ill. Adm. Code 201.207.
3.
 - a. The permittee shall not authorize, cause, direct or allow any modification, as defined in 35 Ill. Adm. Code 201.102, of equipment, operations or practices which are reflected in the permit application as submitted unless a new application or request for revision of the existing permit is filed with the Agency and unless a new permit or revision of the existing permit(s) is issued for such modification.
 - b. This permit only covers emission sources and control equipment while physically present at the indicated plant location(s). Unless the permit specifically provides for equipment relocation, this permit is void for an item of equipment on the day it is removed from the permitted location(s) or if all equipment is removed, notwithstanding the expiration date specified on the permit.
4. The permittee shall allow any duly authorized agent of the Agency, upon the presentation of credentials, at reasonable times:
 - a. to enter the permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,
 - b. to have access to and to copy any records required to be kept under the terms and conditions of this permit,
 - c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,
 - d. to obtain and remove samples of any discharge or emission of pollutants, and
 - e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring or recording any activity, discharge or emission authorized by this permit.
5. The issuance of this permit:
 - a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are located,
 - b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the facilities,

NUMBER : 2

**WITHHELD
DOCUMENT**